Study of Hydrothermally Altered Zones Within the Gujarat-Khachkovi Ore Field Using Terra ASTER Multispectral Satellite Data

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This project consists of interpretations of more than 40 data obtained by remote sensing analyses and techniques in order to detect geological features and potential of probable Gudjareti-Khachkovi ore fields in the area located in South-East Georgia (Adjara-Trialeti folded zone, Lesser Caucasus) using Terra ASTER Multispectral satellite data. Technical specifications for the ASTER data used are as follows: Granule ID: AST3A1 0409160806091107270062, Processing Level: 3, Acquisition Date: 20040916, Scene ID: [171, 87, 1], Processed Bands: "01023N3B0405060708091011121314", Cloud Coverage: 2.

The study area is quite intensive in terms of vegetation, snow, glacier and cloudiness. Therefore, the best satellite data among all ASTER images have been ordered that could represent the area the best way and which has the least snow and cloud cover.

The ASTER image used in this study has approximately 2% cloudiness, 20% vegetation and 35% snow cover in the whole region. In this territory, there have been detected different rock types covering of the study area and lithological descriptions, mineral mapping techniques and analysis towards determination of geological features have been made. According to the conducted works, it was established that magmatic processes and hydrothermally changed zones formed in this way, which are represented by: pyrite, oxidized, sericite and calcined rocks, occupy an important place within the study area. In many cases these rocks are highly fractured and cemented with quartz and quartz-gold veins of various sizes, shapes, orientations and small diameters. Obviously, hydrothermal changes and types of mineralization cannot fully reflect the geological processes taking place in the study area, but as the conducted works show, the mineralization processes are genetically related to the magmatic activity of the region. It should be noted that the study was conducted for the first time in the study area by remote sensing method, which significantly reduces the funds spent on prospecting for ore deposits and significantly increases the efficiency and reliability of our work. We believe that our research will contribute to the more intensive use of the remote sensing method and increase the efficiency of prospecting processes of ore fields in Georgia.

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